California Solar Initiative

California Public Utilities Commission
Staff Progress Report
October 2009

GO solar CALIFORNIA




About this Report

The California Public Utilities Commission (CPUC) Energy Division staff prepared this report to describe recent progress on the California Solar Initiative, the country's largest solar incentive program.

In January 2007, the State of California launched the *Go Solar, California!* campaign, an unprecedented $3.3 billion ratepayer-funded effort that aims to install 3,000 MW of new grid-connected solar over the next decade and to transform the market for solar energy by reducing the cost of solar. The *Go Solar, California!* campaign is the product of Governor Schwarzenegger's "Million Solar Roofs" vision for the State of California. The Governor signed into law Senate Bill 1 in 2006 to authorize the state solar program.

As part of this effort to increase the use of solar statewide, the CPUC launched the California Solar Initiative (CSI), which offers solar incentives to energy users (except new homes) in investor-owned utility territories in California. The CSI Program has a 10 year budget of $2.167 billion, and a goal to install 1,940 MW of new solar.

This Staff Progress report focuses exclusively on CSI Program developments and consumer demand, and does not report on the other parts of the state's solar offerings, such as the California Energy Commission's New Solar Homes Partnership (NSHP), which funds solar installations on new home construction, or the dozens of small solar programs administered by the state's 40+ municipal utilities (or publicly owned utilities, POUs).

Cover Photo Credits

Sun Light & Power, June 18, 2009, Submitted by PG&E.

California Solar Initiative
Quarterly Staff Progress Report
October 2009

Prepared by
California Public Utilities Commission
Energy Division Staff

Lead Authors

Melicia Charles
Amy Reardon

Contributing Authors

Sachu Constantine
Mona Dzvova
Damon Franz
Neal Reardon
Curtis Seymour

Project Manager

Molly Sterkel

Table of Contents

Index of Tables

Index of Figures

1. California Solar Initiative (CSI) Program Highlights Third Quarter 2009

- CSI Program reaches 257 MW installed solar at 21,159 sites since 2007.
- California reaches a cumulative 509 MW of installed solar at 52,714 sites.
- Q3 2009 saw record high demand for new solar applications, including over 2,200 program applications in the month of August.
- Small solar systems prices declined 9 percent and large system prices declined by 13 percent since the same quarter last year.
- All other CSI program components continue to make key progress towards goals, including the two affordable housing programs, the research and development program (RD&D) and the Solar Water Heating Pilot Program (SWHPP).

The CSI Program reaches 257 megawatts (MW) of solar installations at 21,159 sites since 2007.

As of the end of the third quarter, the CSI program has installed 257 MW of new solar photovoltaic (PV) projects--more than a quarter gigawatt-- at over 21,000 sites in the utility territories of PG&E, SCE and SDG&E since 2007.

This capacity is equal to about one-half of an average coal or gas-fired power plant. An additional 6,830 projects are pending, which, if installed, will result in an additional 141 MW of new solar.

The CSI Program supports the installation of new PV projects by providing performance-based financial incentives. The installed projects to date claim $605 million of CSI incentives, while pending projects will be paid another $293 million.

Table 1. All CSI Projects through September 30, 2009

All CSI Projects	
Installed Projects	
Applications	21,159
MW	257 MW
Incentive $million	$605
Pending Projects	
Applications	6,830
MW	141 MW
Incentive $million	$293
Total CSI Activity	
Applications	**27,989**
MW	**398 MW**
Incentive $million	**$898**

Source: www.CaliforniaSolarStatistics.ca.gov, October 1, 2009.

California's 50,000+ solar customers have installed over 500+ MW of solar, enough to replace an entire power plant.

The California Solar Initiative's success is building upon a multi-decade history of solar interconnections in investor-owned utility (IOU) territories in California. According to the most recent data on all solar interconnections, California's three IOUs have 509 MW of grid-connected solar at 52,714 projects. (See Section 3, Solar Interconnection Data below.)

The total solar capacity installed in IOU territories is half a gigawatt and is equal to an average coal or natural gas fired power plant. This capacity includes capacity and sites installed under the CSI program since 2007 (identified in Table 1 above as roughly half the total – 21,159 sites and 257 MWs) as well as systems from New Solar Homes Partnership, Self-Generation Incentive Program, and the Emerging Renewables Programs. (See Section 2.2 below for a history of the different solar incentive programs.)

CSI Program Continues to See Record High Demand

As shown in Table 2**,** Table 3**,** and Figure 1, the CSI Program demand continues to be strong. In August 2009, the CSI Program received a record 2,124 residential applications – a 44 percent increase from the previous record high in June 2009. August 2009 experienced the highest number of applications received in a single month since the start of the program in 2007. This unprecedented demand for residential solar installations was driven by the impending move from Incentive Step 5 ($1.55/watt) to Incentive Step 6 ($1.10/watt) in August in the PG&E territory, and in October in the California Center for Sustainable Energy's (CCSE's) San Diego territory. Figure 8 displays a chronology of the incentive levels by utility and market segment. PG&E alone received 1,602 applications (equaling 10.9 MW of new solar capacity) for residential projects in August 2009.

Table 2. Residential CSI Projects Applications Received in Q3 2009

	Number of Applications	Number of MWs
July	964	4.9 MW
August	2,124	10.9 MW
September	1,396	6.9 MW

Source: www.CaliforniaSolarStatistics.ca.gov, September 30, 2009.

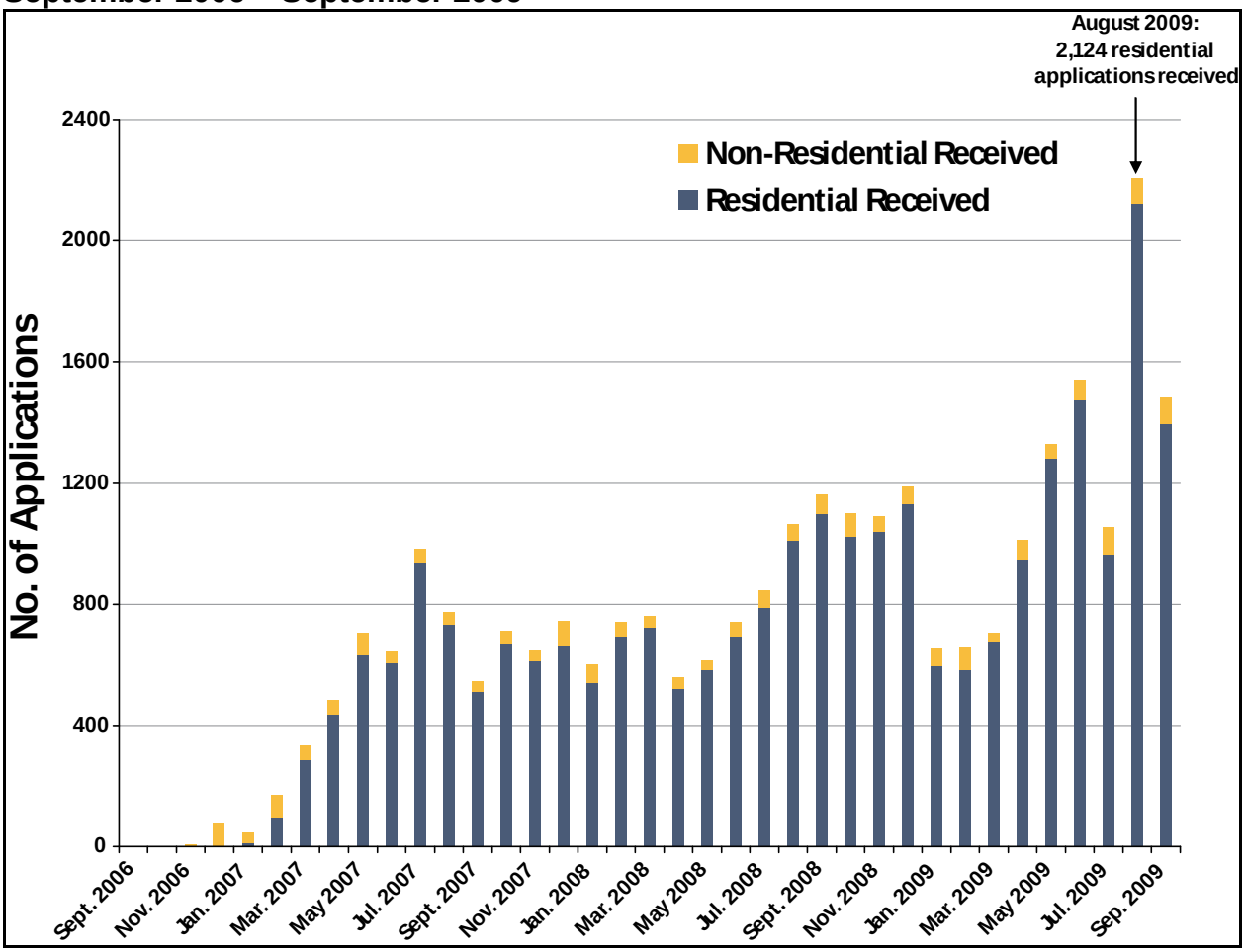
As shown in Table 3, non-residential demand was also strong in Q3 2009. July 2009 was the peak month in non-residential demand since the inception of the program in 2007 in terms of number of applications received. September was the second highest month in non-residential applications since the start of the program.

Table 3. Non-Residential CSI Projects Applications Received in Q3 2009

	Number of Applications	Number of MWs
July	89	6.2 MW
August	83	5.3 MW
September	86	10.1 MW

Source: www.CaliforniaSolarStatistics.ca.gov, September 30, 2009.

Figure 1. Total Number of New Applications per Month by Customer Sector, September 2006 – September 2009



Source: www.CaliforniaSolarStatistics.ca.gov, September 30, 2009.

Small solar systems prices declined 9 percent and large system prices declined by 13 percent since last year.

One of the CSI Program's legislated goals is to help build-up a robust solar energy market and ultimately lower the total cost of PV systems, allowing the price of solar energy to move towards grid parity. The CPUC has begun to study the Program's effect on short-term prices, noting a downward trend in total system costs on a $ per watt ($/watt) basis. The total system cost is the price before the California Solar Initiative incentive and before any federal tax credits are applied.

While the numbers do fluctuate over time, recent CSI data shows a decline in the total PV system cost per watt over the past 5 quarters. When comparing the average cost per watt of PV systems installed in the third quarter of 2008 and PV systems installed in the third quarter of 2009, there is a 9 percent decline for small systems and a 13 percent decline for large systems.

More PV solar system cost data is described in Section 5.1.

Table 4. Average Solar System Costs by Quarter, Based on Date Project Reservation was *Received*

	PV Systems Under 10 kW		PV Systems over 10 kW	
	Average Cost $/watt	**% decline since Q3 2008**	**Average Cost $/watt**	**% decline since Q3 2008**
Q3 2008	$9.92		$9.28	
Q4 2008	$9.70	*-2.2%*	$9.24	*-0.4%*
Q1 2009	$9.55	*-3.7%*	$8.95	*-3.6%*
Q2 2009	$9.34	*-5.8%*	$8.17	*-12.0%*
Q3 2009	$9.02	*-9.1%*	$8.05	*-13.3%*

Source: Chart data was derived from the filtered data set on www.CaliforniaSolarStatistics.ca.gov, September 30, 2009. The data is listed in nominal dollars and is derived from simple $/watt averages on a per-project basis.

Other Third-Quarter Program Highlights

Other program highlights described in this report from the third quarter 2009 include:

- The **CSI general market program** anticipates a paperless application process, allowing users to upload forms and other documents electronically, by January 2010.

- The **CSI Single-family Affordable Solar Homes (SASH)** program saw applications remain strong, and more residences have been identified as potentially program-eligible.
- The **CSI Multifamily Affordable Solar Housing (MASH)** applications are robust, with 139 applications totaling 7.13 MW of solar power within the program's first year.
- The **CSI Research Development, Demonstration, and Deployment (RD&D)** Program issued its first grant funding solicitation, seeking breakthrough technologies in PV integration with the transmission and distribution system.
- The **Solar Water Heating Pilot Program (SWHPP)** continues steady in San Diego, while CPUC issued a Staff Proposal in July outlining a statewide CSI-Thermal Program, that would offer solar water heating incentives to both electric and gas customers, statewide in 2010.

2. Introduction to the California Solar Initiative

The California Solar Initiative (CSI or CSI Program) is overseen by the California Public Utilities Commission (CPUC) and provides incentives for photovoltaic (PV) solar system installations to customers of the state's three large regulated electric investor-owned utilities (IOUs): Pacific Gas and Electric Company (PG&E), Southern California Edison (SCE) and San Diego Gas and Electric (SDG&E).[1] The CSI Program provides incentives for solar systems installed on existing residential homes, as well as existing and new commercial, industrial, government, non-profit, and agricultural properties within the service territories of the large IOUs.

The CSI Program demonstrates the State's strong support for solar technology and grew out of Governor Schwarzenegger's vision for a "Million Solar Roofs" in the State of California.[2] The CSI Program was authorized by the CPUC in a series of regulatory decisions throughout 2006. In addition, the Legislature expressly authorized the CPUC to create the CSI Program in 2006 in Senate Bill (SB) 1 (Murray, 2006).

The CSI Program focuses exclusively on onsite, grid-connected solar that is used by electric customers seeking to offset some portion of their own load by installing solar PV or other solar electric generating systems. The CSI Program does not fund large, free-standing solar power plants designed to serve the electric grid or help utilities meet Renewable Portfolio Standard (RPS) obligations.[3]

2.1 CSI Program Components

The CSI Program has a budget of $2.167 billion over 10 years, from 2007-2016. The goals of the CSI Program are to:

- Install 1,940 MW of distributed solar energy systems in the large IOU service territories;
- Transform the market for solar energy systems so that it is price competitive and self-sustaining.

The CSI Program has five program components, as shown in Table 4, each with its own Program Administrator and budgets overseen by the CPUC:

- The **CSI general market solar program** is administered through three Program Administrators: PG&E, SCE, and the California Center for Sustainable Energy (CCSE) in SDG&E territory. The goal is 1,750 MW with a ten-year budget of $1.9 billion.
- **The CSI Single-family Affordable Solar Homes (SASH) Program** provides solar incentives to qualifying single-family, low income housing owners. The SASH Program

is administered through a statewide Program Manager, GRID Alternatives, with a budget of $108 million through 2015.

- **The CSI Multifamily Affordable Solar Housing (MASH) Program** provides solar incentives to multifamily low income housing facilities. The MASH Program also has a $108 million budget through 2015 and is administered through the same Program Administrators as the general market solar program: PG&E, SCE, and CCSE.
- **The CSI Solar Water Heating Pilot Program (SWHPP)** provides solar hot water incentives through a pilot program for residences and businesses in the San Diego area only; the SWHPP is administered through CCSE with a budget of $2.6 million.
- **The CSI Research, Development, Demonstration and Deployment (RD&D) Program** provides grants to develop and deploy solar technologies that can advance the overall goals of the CSI Program, including achieving targets for capacity, cost, and a self-sustaining solar industry in California. The RD&D Program is administered through the RD&D Program Manager, Itron, Inc., and has a budget of $50 million.

Table 5. CSI Budget by Program Component, 2007-2016

	Budget ($ Millions)	Goal (MWs)
General Market Solar Program	$1,897	1,750 MW
Single-family Affordable Solar Homes (SASH)	$108	85 MW
Multifamily Affordable Solar Housing (MASH)	$108	85 MW
Research, Development, Demonstration, and Deployment (RD&D)	$50	~
Solar Hot Water Pilot Program (SWHPP)	$2.6	750 SWH systems
Total CPUC CSI Budget	**$2,167**	**1,940 MW**

Source: CPUC D.06-12-033, p.26.

2.2 Other Solar Programs

When it launched in January 2007, the CSI Program built upon nearly 10 years of state support for solar, including other incentive programs such as the Emerging Renewables Program (ERP) and the Self-Generation Incentive Program (SGIP). Both programs still exist to provide incentives for other clean technologies, but the projects have been closed to new solar project applications since the end of 2006.

The CSI Program is one part of the broader solar effort in California, branded collectively as the *Go Solar, California!* campaign. In authorizing a total expenditure of $3.3 billion, the Legislature identified two additional programs to support the goal of installing 3,000 MW of

solar capacity statewide, as detailed in Table 5. One is the California Energy Commission's New Solar Homes Partnership (NSHP) that offers solar incentives to new homes in large IOU territories and leverages the Energy Commission's oversight of building codes and standards. The other is a set of solar programs offered through publicly-owned utilities (POUs) that are not regulated by the CPUC. The statewide solar effort is promoted collectively on the *Go Solar, California!* Web site, www.GoSolarCalifornia.ca.gov, a one-stop Web portal[4] for all information relevant to the State's solar rebate programs for consumers and contractors alike. Each program under the *Go Solar, California!* campaign operates independently; however, the programs partner on marketing and outreach when cost effective, such as the with statewide events and the Web site.

Table 6. Go Solar, California! Program Components[5]

Program Authority	California Public Utilities Commission	California Energy Commission	Publicly Owned Utilities (POUs)	Total
Budget	$2,167 million	$400 million	$784 million	$3,351 million
Solar Goals (MW)	1,940 MW	360 MW	700 MW	3,000 MW
Scope	All solar systems in large IOU areas except new homes	Solar systems on new homes in large IOU areas	All solar systems in POU areas	All of California[5]

Source: SB 1 (Murray, 2006).

3. Solar Interconnection Data

The California Solar Initiative started in 2007 and builds upon two decades of solar interconnections in California. Table 7 shows all solar interconnections in investor-owned utility (IOUs) territories. According to the most recent data on all solar interconnections, California's three IOUs have 509 MW of grid-connected solar at 52,714 projects. The total solar capacity installed in IOU territories is half a gigawatt (GW) and is equal to an average coal or natural gas fired power plant. This total solar capacity includes capacity and sites installed under the CSI program since 2007 (Table 1 shows 21,159 sites and 257 MWs as installed under CSI) as well as capacity from systems from New Solar Homes Partnership, Self-Generation Incentive Program, and the Emerging Renewables Programs. Table 7 distinguishes Net Energy Metered (NEM) solar customers and Non-NEM solar customers. NEM is available to solar customers, and most customers participate in NEM, but it is not always the preferred tariff rate. A significant number of customers – 245 customers and 43 MW do not participate in NEM tariffs. The table also shows, for comparison sake, that there is an additional 1,493 MWs not yet installed, but planned, under the California Solar Initiative.

Table 7. All Solar Interconnections in Investor-Owned Utility (IOU) Territories

	PG&E	SCE	SDG&E	Total
NEM SOLAR Customer-Generators[1]	33,642 customers	11,423 customers	7,404 customers	52,469 customers
Non-NEM SOLAR Customer-Generators	206 customers	39 customers	0 customers	245 customers
Total SOLAR Customer-Generators	33,848 customers	11,462 customers	7,404 customers	52,714 customers
NEM SOLAR Customer-Generators, rated generating capacity (MW)	276 MW	132 MW	58 MW	466 MW
Non-NEM SOLAR Customer-Generators, rated generating capacity (MW)	23 MW	20 MW	0 MW	43 MW
Total SOLAR Customer-Generators, rated generating capacity (MW)	299 MW	152 MW	58 MW	509 MW
MW remaining in CSI general market program (not yet installed from the 1,750 MW total program goal)	*622 MW*	*715 MW*	*156 MW*	*1,493 MW*

Source: CPUC data request to PG&E, SCE, SDG&E, data through September 30, 2009. Note: MW figures are all reported based on the CEC-AC rating of solar systems.

[1] Includes some hybrid solar/wind systems, less than 1 MW statewide.

4. CSI Programmatic Updates

This section reports on the status and progress since June 2009 of each of the five CSI Program components. Each section starts with background on the program component, including program design and offering, and then provides a snapshot of program activity.

For more detailed information on how to participate in any of the CSI Program components, please see the CSI Program Handbook or the CSI Consumer Guide, both available for download at www.GoSolarCalifornia.ca.gov.

4.1 California Solar Initiative's General Market Program

The general market program is the main incentive program component of the CSI, and is administered through three Program Administrators: PG&E, SCE, and California Center for Sustainable Energy (CCSE) in SDG&E territory.

One of the primary goals of the Program Administrators in the 3rd quarter was to *streamline* and *simplify* the incentive application process for residential, commercial, governmental, and non profit CSI participants. A number of forms can now be submitted via the internet based on the *May Program Handbook* update; other forms were revised or eliminated. The recent Program Handbook changes demonstrate the efforts by the Program Administrators to address the needs of the solar industry and CSI participants. The Program Handbook changes recently implemented by CPUC staff in the 3rd quarter include the following:

- Major reformatting of the Program Handbook sections, which now includes a separate technical section for easier reference;
- Inclusion of the Single-family Affordable Solar Homes (SASH) Handbook (Appendix J);
- Implementation of the Multifamily Affordable Solar Housing (MASH) program's Track 2 incentives (See below for explanation of Track 2);
- Extension of the solar installation reservation expiration period to 180 days for schools and community colleges; and
- New metering requirements, performance-based incentive (PBI) payment terms and Performance Data Provider (PDP) requirements.

The Program Administrators are moving towards having a completely paperless application process by January 2010, which will enable applicants to supply documents electronically. The Program Administrators are working on several PowerClerk™ application database changes to enable this change, including adding an attachment upload feature to PowerClerk™ and adding

an automatic application uploader (via script) that will interface with in-house solar contractor sales and quotation tools.

The CPUC included changes in the *May 2009 Program Handbook* to conform to the California Energy Commission's December 2008 *Guidelines for California's Solar Electric Incentive Programs as mandated by SB 1* (Murray, 2006). These include requiring participants to obtain information on appropriate Energy Efficiency (EE) measures and to consider the effect of installing such measures on system sizing and design. Program Administrators will now provide specific, useful information to the participants regarding EE options. Additional EE restrictions apply for buildings over 100,000 square feet, which must meet specific benchmarking standards for EE prior to installation or have a firm commitment to doing so within one calendar year. Residential and non-residential EE Disclosure Agreement and Commitment Forms are now required for CSI participants.

The CPUC staff is currently reviewing two sets of additional Program Handbook changes. The changes include new metering, reporting, and performance requirements proposed by the CEC in December 2008. The CEC has mandated both a +/- 5% accuracy standard for inverter-integrated meters and the creation of testing protocols to ensure compliance. If approved by the CPUC, the requirements will be effective January 1, 2010.

The CPUC staff is planning to review new language related to implementation of AB 1551 (Fuentes, 2009), which, among other changes, clarifies the eligibility definitions for the affordable housing components of CSI.

4.2 Single-family Affordable Solar Homes (SASH) Program

The Single-family Affordable Homes program (SASH) is managed by GRID Alternatives, a non-profit organization founded in 2001 that provides solar services and training in low-income communities. Under the SASH guidelines, eligible households receive a one-time payment under the CSI EPBB incentive structure to help reduce the cost of installation. The SASH program offers fully-subsidized (free systems) to single family households classified as "extremely low income", and partially subsidized systems to households that are classified as "low income."

In Q3 2009, the SASH Program continued to expand at a steady pace. Nearly all of the installed systems were fully subsidized by leveraging other funding partners with the SASH incentive. GRID Alternatives is anticipating rapid growth of the SASH Program over the next few quarters and in Q3 launched the Subcontractor Partnership Program which will enable contractors

throughout California to install PV-solar systems under SASH. Over 1,200 addresses were identified as meeting the SASH affordable housing requirements. The total amount of incentives paid for Q3 was $122,273 for 24 systems.

4.3 Multifamily Affordable Solar Housing (MASH)

MASH offers two types of incentives, Track 1 and Track 2. Track 1 offers up-front incentives for solar systems that cover the electricity load for common and tenant areas. Track 2 offers higher incentives to applicants who provide quantifiable "direct tenant benefits" (i.e. any operating costs savings from solar that are shared with their tenants). Applications for Track 2 incentives are accepted every six months through a competitive bid.

In its first year, the MASH Program has seen steady growth in program participation. PG&E has received 123 applications totaling 5.4 MW and $19 million in Track 1 incentives. SCE has doubled its application volume since June with 14 applications totaling 1.4 MW and $5.3 million in Track 1 incentives. CCSE, which manages the smallest CSI service territory, has received 2 applications totaling 330 kW and $1.3 million in incentives.

Track 2 incentives, which allow applicants to receive higher payments through a competitive bid process, are now available. Applicants must provide direct financial benefits to affordable housing tenants to receive these incentives. The MASH Program Administrators are currently reviewing the first round of Track 2 proposals, and are expected to announce the winning bidders later this year. The next call for Track 2 proposals is expected to take place in the first half of 2010. For more information on the MASH Program and incentive structure, please visit: http://www.gosolarcalifornia.ca.gov/csi/low_income.html.

4.4 CSI Research, Development, Demonstration, and Deployment (RD&D) Program

Itron, the CSI RD&D Program Manager, issued the first grant funding solicitation in August of 2009. This solicitation sought promising breakthroughs in improving the integration of PV with the transmission and distribution systems. In total, there were 19 applications submitted by leaders in the solar industry, national labs, non-profit organizations, utilities and universities. The Scoring Committee is currently evaluating the bids and will present recommendations to the Commission, with Commission action of the first round of grant awards expected by the end of 2009.

On September 25, 2009 Itron issued a draft second grant funding solicitation covering PV production technologies and innovative business models. The draft document was open for comment through October 12th, and can be found at: http://www.calsolarresearch.org. After comments are received, the second grand funding solicitation will be released in its final form, inviting responses later in the fall.

4.5 Solar Water Heating

On July 15, 2009, Energy Division issued a Staff Proposal that recommends the creation of a new CSI-Thermal Program to promote the installation of solar water heaters and other solar thermal technologies in the service territories of all investor-owned utilities in California. This proposed program would dedicate $337.5 million with the ultimate goal of building a robust market for technologies that use the heat of the sun in water heating, space heating and other applications that offset fossil fuel use for heating and cooling.

The Staff Proposal advocated combining under one administrative structure the $250 million for natural-gas displacing systems authorized by AB 1470 with $100.8 million for electric-displacing systems set aside under the CSI Program. In that document, Energy Division recommended that the CSI-Thermal Program begin accepting applications on January 1, 2010, if possible. Commission approval by majority vote is required before the program takes effect. Energy Division hosted a public workshop on August 3, 2009 to answer questions about the proposal, and parties filed comments in August. A CPUC Proposed Decision that takes into consideration the positions of the parties is expected to be issued for public comment later this year. Development of the program's detailed features will require several months or more thereafter.

4.6 Measurement and Evaluation

The CSI Program Evaluation Plan, adopted in July 2008, established a plan to conduct program evaluations to support the CSI in achieving its goals and creating a transparent program. The CSI Program Evaluation Plan has a nine-year work-plan and is intended to ensure that the CPUC, and by extension the CSI Program Administrators, manage the CSI in a manner consistent with the intent of the Legislature, as well as the CPUC’s objectives and directives. In addition to supporting the annual report to the Legislature as required by SB 1, the Evaluation Plan is designed to ensure that the CSI Program’s impacts are independently evaluated, measured, and verified to provide reliable results for decision makers, resource planners, and program implementers. In addition, the SASH, MASH, RD&D and SWHPP program components each have separate evaluation budgets and plans.

Currently, three major evaluation studies are underway for the general market CSI program: the CSI Impact Evaluation, the CSI Cost-Effectiveness Evaluation and the CSI Process Evaluation. The ongoing CSI Impact Evaluation began in March; the CSI Cost-Effectiveness Evaluation was underway as of July and will wrap up sometime in March or April of 2010; and the CSI Process Evaluation is currently studying end-to-end processing of CSI applications with a view towards improving program efficiency, with results expected early next year. The CPUC has also issued a Request for Proposals (RFP) for a joint evaluation of the SASH and MASH programs, although they are not covered directly by the CSI Evaluation Plan.

4.7 Marketing and Outreach

The CSI Program currently operates with a $1.5 million annual marketing and outreach (M&O) budget pursuant to the Interim M&O Decision (D.07-05-047.) Each Program Administrator was granted a $500,000 portion of their administrative budgets to conduct a range of basic M&O activities, including publication of a monthly electronic newsletter, training and outreach activities and basic collateral to promote the CSI Program. The Decision states that the Program Administrators may each request an additional $100,000, which was approved for special projects like the San Diego Solar Map partnership with DOE, customer billing integration with the San Francisco Solar Map, direct activities to engage potential solar customers and additional Program Administrator Web upgrades.

The CSI program's electronic newsletter continues to grow monthly, in October surpassing 6,000 email subscribers. The newsletter provides the public with easy access to CSI program updates, tools and links to useful documents and monthly solar class schedules. To subscribe, please visit www.gosolarcalifornia.ca.gov/news.

Program Administrators offer a broad and expanding curriculum of free solar classes from solar basics for homeowners to more technical topics for solar contractors. In the SCE territory, evening classes called Homeowner Solar Information Sessions (HSIS) have been so successful that most classes have waiting lists. Furthermore, the popularity of the classes—and the enthusiasm of the participants—inspired the development of SCE's Solar Fair, bringing these HSIS attendees together with solar contractors to take the next step and go solar. CCSE and PG&E also offer popular webinars for solar contractors.

The *Go Solar, California!* team will represent the program at the 2009 Solar Power International Expo, with a large stock of newly-updated fact sheets, CSI Consumer Guides and a 2010 *Go Solar, California!* wall calendar. Solar contractors can contact their Program Administrator to obtain printed copies of any helpful CSI marketing materials for their promotional use.

In July, CCSE celebrated the launch of the new San Diego Solar Map, an interactive tool that enables solar contractors, potential customers and others interested in solar installations to see the solar potential for individual properties and the locations of other solar PV systems. Interactive features allow blogging, notes and informative displays to help people determine their solar needs. Currently, PG&E is developing a customer billing integration tool for the SF Solar Map to bring more functionality to their consumers.

Currently, CPUC staff, CSI Program Administrators and other statewide solar participants have some together under the banner of the "October is Solar Energy Month" campaign. The call to action is to encourage everyone—from residential beginners to savvy solar pros—to attend a solar class, a solar tour or any of the dozens of solar events scheduled for October and beyond. The *Go Solar, California!* Web site now hosts the Community Solar Calendar, complete with a submission feature and other user functions.

CPUC staff is collaborating with the California Energy Commission to update the *Go Solar, California!* Web site. Consulting firm Wallrich Landi was hired by the CEC (using remaining NSHP M&O contract funds with Edelman and Associates) to update the layout, streamline the site architecture and recommend user enhancements like social media, dashboards and other features. The re-launch is anticipated by the end of 2009.

The CPUC is expected to issue a decision on long-term CSI marketing and outreach, including potential expansion of the marketing and outreach budgets, as part of the DG/CSI Proceeding (R.08-03-008).

4.8 Cost-Benefit Methodology

In August 2009, Decision (D.) 09-08-026 adopted a methodology for assessing the costs and benefits of distributed generation (DG). DG includes customer-owned generation facilities such as solar photovoltaics, wind turbines, biogas, fuel cells, microturbines, small gas turbines, internal combustion engines, and combined heat and power cogeneration plants. Given that many of the initiatives supporting DG in California, including the CSI, are fundamentally market transformation programs, a robust cost-benefit analysis is critical in assessing progress toward the over-arching goal of achieving "grid-parity" for the effective cost of DG. A cost-benefit analysis is not the only measure of a policy or program's worth, but it is an essential input when deciding to continue, modify, or terminate a particular effort.

The methodology adopted by the Commission is very similar to the one used for assessing energy efficiency (EE) resources, applying the same three perspectives and the so-called E3[6] cost-effectiveness methodology, named for the consultants who worked on it in the EE proceedings. E3 has also been contracted to carry out the cost-benefit evaluation of the CSI, using the approved methodology. From the perspectives of the participant, the Program

Administrators (utilities), and society as a whole, E3 will attempt to capture all costs and benefits, including environmental and ancillary services benefits that are appropriately associated with distributed PV solar generation. E3 will also be carrying out an evaluation of Net Energy Metering (NEM), as mandated by the Legislature that will cover multiple technologies receiving NEM credits. For NEM, the results are anticipated in January 2010, while results for the CSI study are expected in March or April, 2010.

5. CSI Program Data

5.1 Costs of Completed CSI PV Systems

PV System Costs are Declining

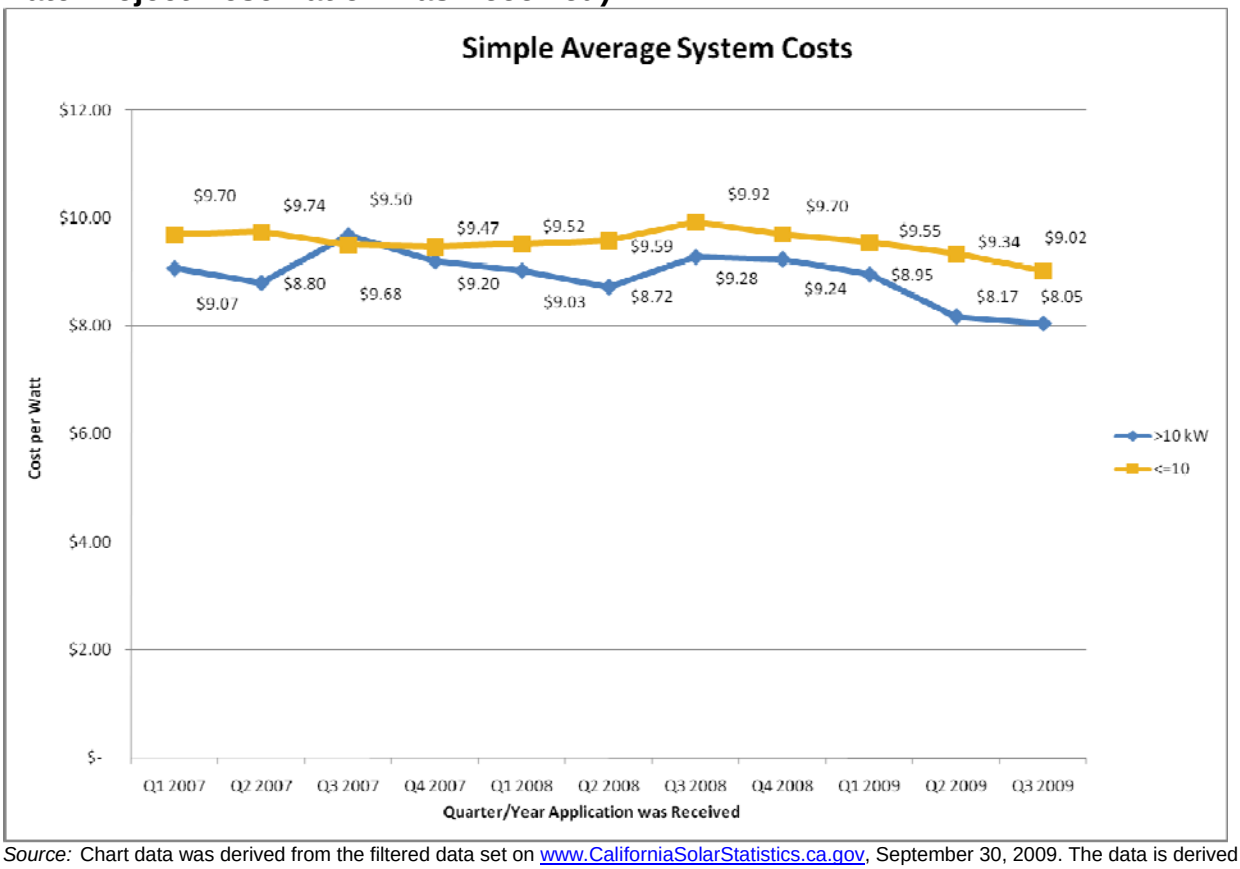
Prices for solar systems funded under the California Solar Initiative have showed a decline since 2007. In 2008, costs did increase slightly, peaking towards the end of the year/early 2009. As 2009 has progressed, costs have decreased each quarter, particularly in systems over 10 kW. Figure 2 and Figure 3 below show average California Solar Initiative system costs for systems under 10 kW and greater than 10 kW.

The difference between the two figures is the first shows prices for projects based on when the project started (received a CSI reservation) and the second figure shows prices for projects based on when the project completed. In both figures, prices are only shown for completed systems. While there is a price decline in both charts, the price decline trend is not as obvious in the second chart because there are some systems that completed in 2009 that were priced (contracted for) when prices were higher last year. All costs are averages of system costs on a $/watt basis and are shown in nominal dollars, not adjusted for inflation.

Figure 2 shows average prices for CSI systems based on when the reservation was received. This chart shows how prices have been changing over time based on when the customer made a CSI reservation, which usually corresponds to locking in a pricing contract. Looking at pricing based on reservation date, or based on project vintage, is probably the best way to discern near-term price change trends.

- PV systems over 10 kW that submitted their CSI applications in Q3 2009 (and are already complete) showed a 13 percent decline in $/watt as compared to systems that submitted their CSI applications in Q3 2008 (year over year).
- PV systems under 10 kW (most residential is under 10 kW) that submitted their CSI applications in Q3 2009 showed a 9 percent decline in $/watt as compared to systems that submitted their CSI applications in Q3 2008 (year over year decline).

Figure 2. Average California Solar Initiative System Costs by Quarter (Based on Date Project Reservation was *Received*)

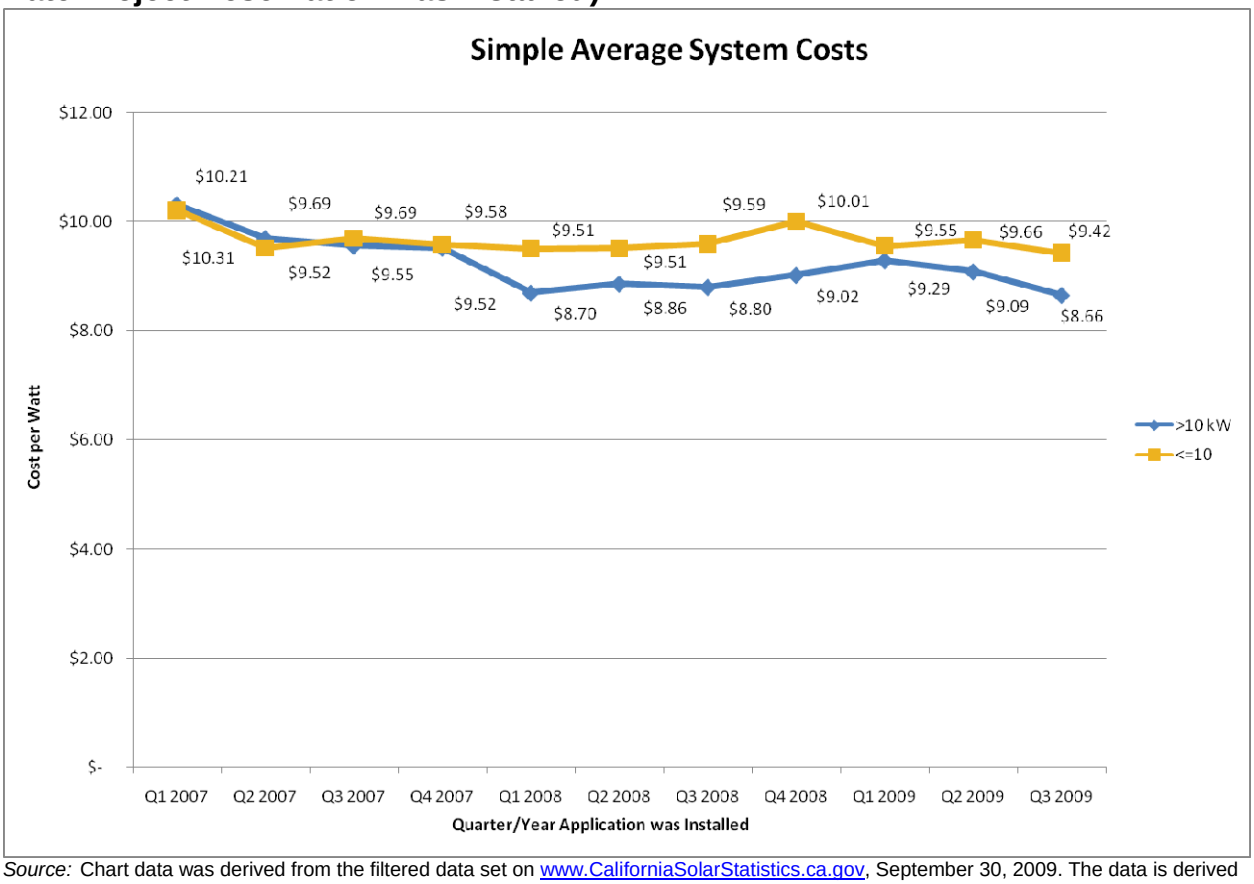


Source: Chart data was derived from the filtered data set on www.CaliforniaSolarStatistics.ca.gov, September 30, 2009. The data is derived from simple $/watt averages on a per-project basis, and listed in nominal dollars. All projects are installed, and each data point reflects the average of cost of all the projects that were reserved in a specific quarter.

Figure 3 (next page) shows average prices for CSI systems based on when the installation was completed. This chart shows how prices have been changing over time based on when the customer finished their solar project; however, it does not take into account that some projects take over a year to go from the reservation stage to the completion stage. This chart does not account for the vintage of the CSI reservation, which usually corresponds to locking in a pricing contract, instead it shows the prices for the projects that were installed each quarter (regardless of when they started). This figure shows a much more modest decline in prices when compared to systems installed the year before. Compared to Figure 2, there is far less of a price decline discernable in the market when looking at prices based on project completion date.

- CSI PV systems over 10kW that were installed in Q3 of 2009 showed a modest 2 percent decline in $/watt when compared to systems installed in Q3 2008.
- CSI PV systems under 10 kW (which includes most residential systems) that were installed Q3 2009 showed a 2 percent decline when compared systems installed in Q3 2008.

Figure 3. Average California Solar Initiative System Costs by Quarter (Based on Date Project Reservation was *Installed*)



Source: Chart data was derived from the filtered data set on www.CaliforniaSolarStatistics.ca.gov, September 30, 2009. The data is derived from simple $/watt averages on a per-project basis, listed in nominal dollars.

5.2 CSI Program Administrator Snapshot

The CSI Program has nearly 28,000 active applications for 398 MW of new solar in the large investor-owned utility territories.

Figure 4, Figure 5, Figure 6 show the cumulative installed and pending CSI Program applications, broken out by Program Administrator and sector, in MW, volume of applications and incentive dollars.

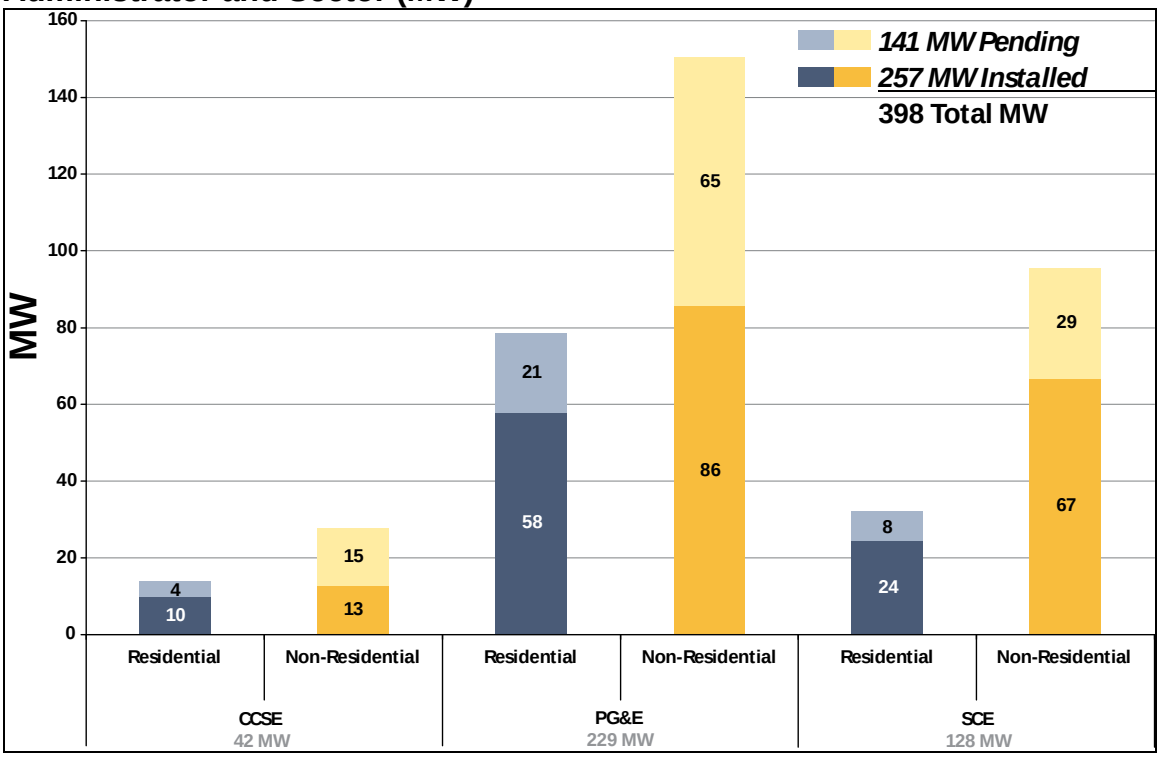
PG&E. PG&E's territory continues to show the strongest demand in terms of the number of residential and non-residential applications, capacity (cumulative size of the projects), and incentive dollars allocated to these projects. The number of PG&E pending applications saw a 30 percent increase in volume (number of applications), and a 39 percent increase in capacity

(MW), in Q3 alone. This sharp increase is largely due to the record demand in the residential sector in the third quarter. As of the end of September, PG&E had a cumulative total of $473 million in incentives allocated to pending and installed projects. With 58 MW of residential applications installed in the program, PG&E is closing in on 25 percent of their overall 252 MW goal for residential projects as of Q3 2009.

SCE. SCE demonstrated strong program participation in Q3 from the non-residential sector. The number of pending applications grew by 20 percent. SCE also saw a significant increase (22 percent) in residential installations in the third quarter. The capacity of residential installations (24 MW) also grew by 22 percent. SCE has allocated $321 million to pending and installed projects.

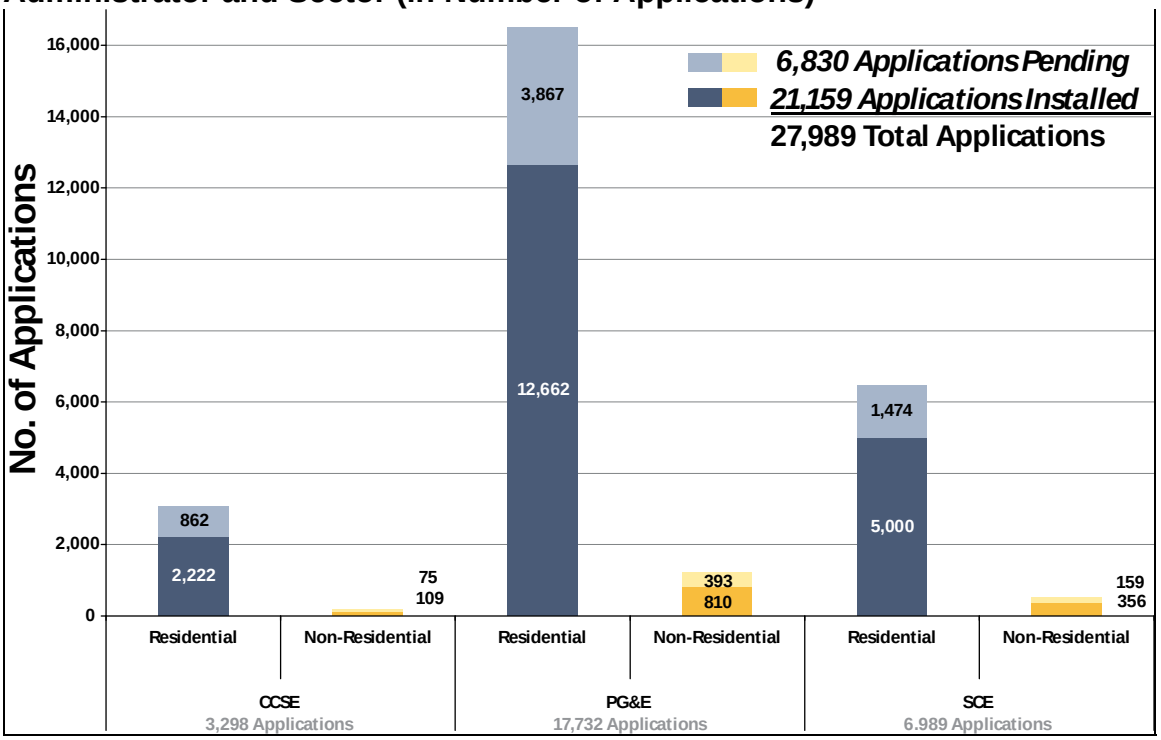
CCSE. CCSE also had a strong third quarter in 2009. The number of CCSE residential and non-residential applications increased by 28 percent in Q3. CCSE saw a 32 percent increase in the capacity of pending and installed residential projects in the last quarter, as well as a 16 percent increase in non-residential capacity of pending projects. Overall, CCSE has allocated $105 million in incentives to pending and installed CSI projects.

Figure 4. Total Capacity of Pending and Installed CSI Applications by Program Administrator and Sector (MW)



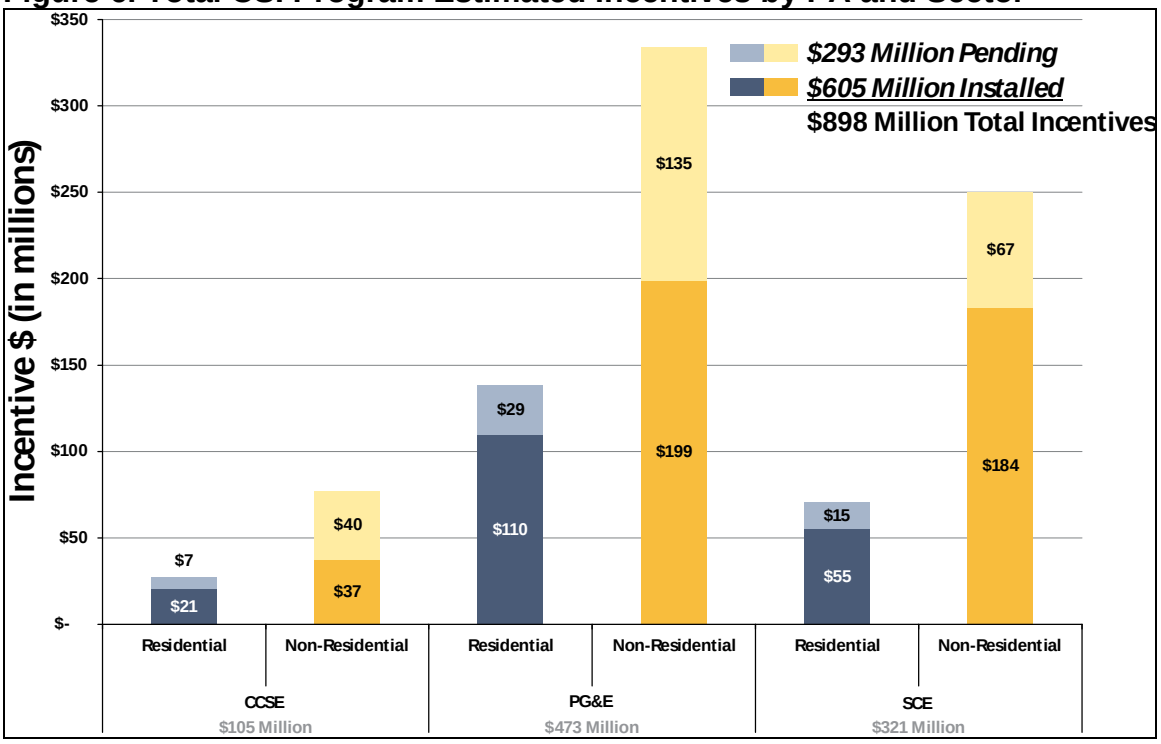
Source: www.CaliforniaSolarStatistics.ca.gov, September 30, 2009.

Figure 5. Total Volume of Pending and Installed CSI Applications by Program Administrator and Sector (in Number of Applications)



Source: www.CaliforniaSolarStatistics.ca.gov, September 30, 2009.

Figure 6. Total CSI Program Estimated Incentives by PA and Sector

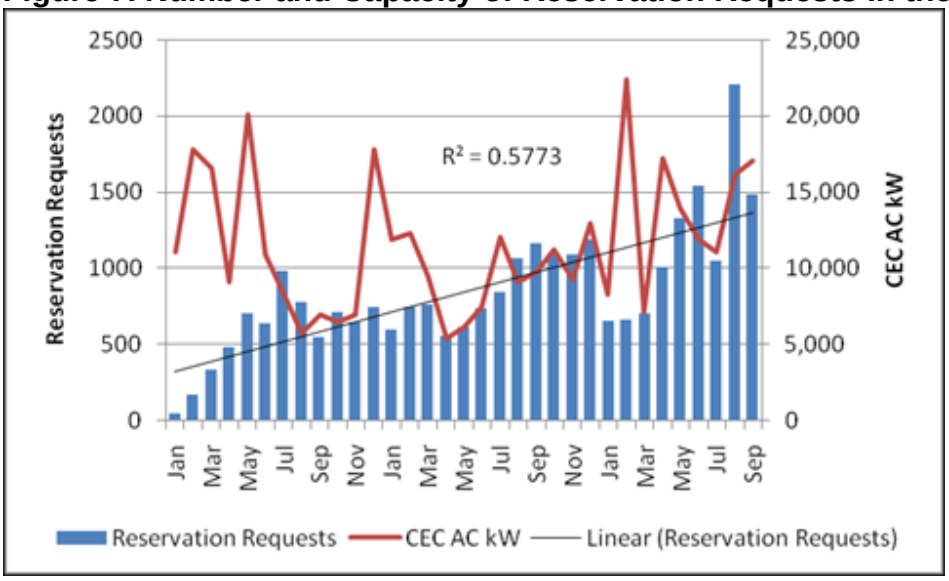


Source: www.CaliforniaSolarStatistics.ca.gov, September 30, 2009.

The CSI Program demonstrates a steady increase in the number of applications reserved monthly.

As shown in Figure 7 below, while there is some variation in the number of reservation requests each month (displayed in the bars), there is an upward trend in the number of requests per month. The capacity of reservations (displayed in the red line) shows sharper variations each month, and it is difficult to determine any trends in the data.

Figure 7. Number and Capacity of Reservation Requests in the CSI Program

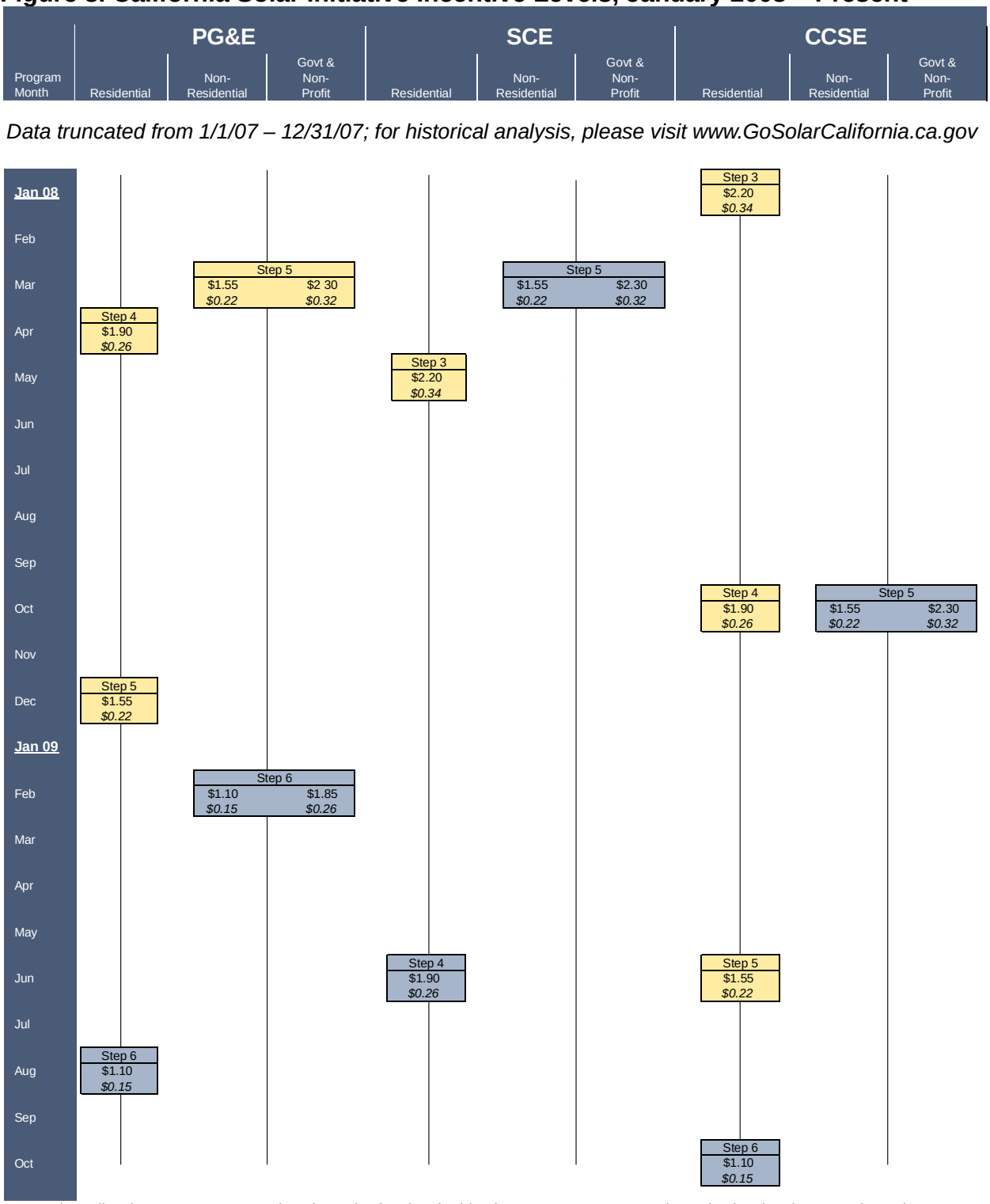


Source: The California Center for Sustainable Energy, October 2009.

The CSI Program continues to see strong demand despite a decrease in the available incentive levels.

As shown Figure 8**,** the incentive levels dropped to Step 6 in Q3 2009 in both the San Diego Gas & Electric Territory (where the Program Administrator is CCSE), and in the PG&E territory. The impending change in step level, often carefully anticipated by the solar industry, is considered responsible for increases in residential demand in those areas. As noted in the CSI Annual Program Assessment (June 2009), there is often a surge in demand right before an incentive level, and a slight drop off in demand right after an incentive level drops. However, the step change impact on demand patterns appears to be temporary in nature. (See CSI Annual Program Assessment, pages 15-16, available at www.cpuc.ca.gov.)

Figure 8. California Solar Initiative Incentive Levels, January 2008 – Present



Notes: The yellow boxes represent previous incentive levels. The blue boxes represent current incentive levels. The EPBB incentive amount (dollars/Watt) is displayed on the top of each incentive step box, and the PBI incentive amount (cents/kWh) is displayed in italics on the bottom of each incentive step box.

5.3 California Solar Statistics Website

California Solar Statistics (www.CaliforniaSolarStatistics.ca.gov) is a public Web site managed by the CSI Program that provides complete data on the California Solar Initiative. See Figure 9 for a sample screen shot. Users can obtain detailed program data in Excel spreadsheets and high-level information in the form of charts and graphs. The data is cleaned and filtered and a spreadsheet of the filtered data is made available and updated on Wednesday of each week.

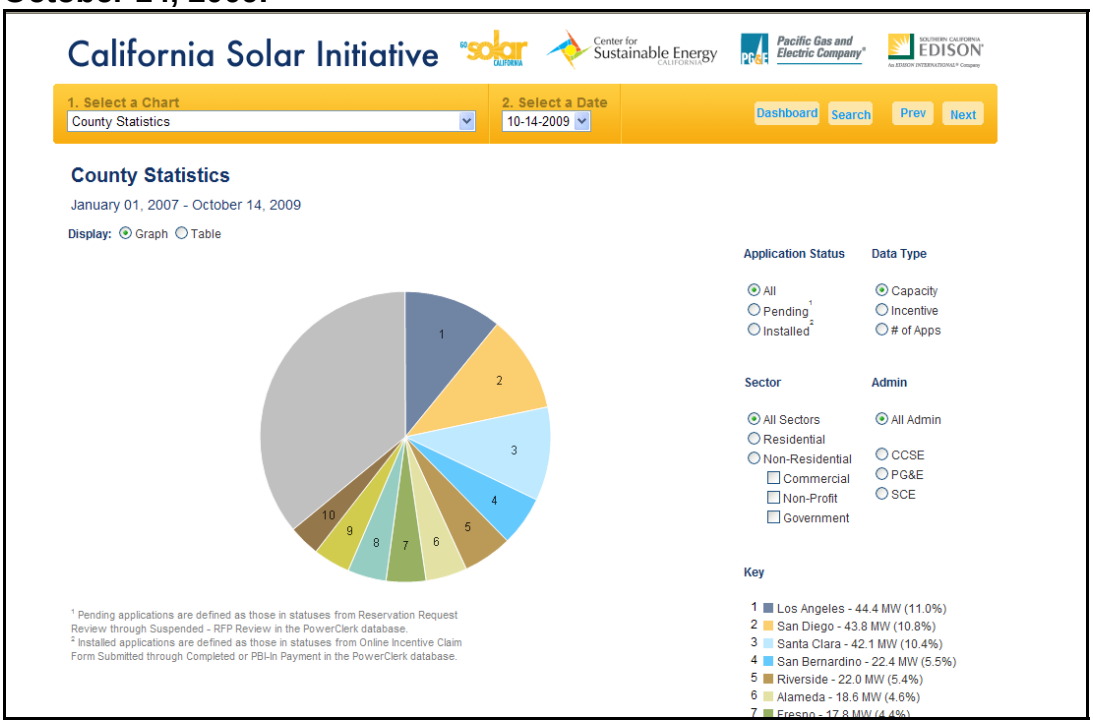
California Solar Statistics consists of three main features:

Charts and Figures
A drop-down menu allows users to view a range of data in either chart or graphical format. Data is specified according to date, Program Administrator territory, customer class and both installed and pending projects. Each data set has notes and a description, as well as a Resources tab that links to raw data files. This tool is particularly useful for looking at demand for solar and participation in the program over time, and comparing program participation among different territories and customer classes. The downloadable tables allow users to easily recreate the charts for analysis and presentations.

Customized Search Function
The customized search function help users find specific information about the CSI program that is not captured in the high-level charts. The search feature is especially useful for finding data specific to regions, customer sectors, numbers of applications, installations and pending solar projects, solar contractors and sellers, equipment and incentives to help guide solar analysis and decision making. As with the chart feature, search results can be exported to Excel for further analysis.

Raw Program Data
California Solar Statistics lists many data sets in ready-made format on the main dashboard, but users can also access comprehensive data from the CSI Application Database as an HTML file or Excel spreadsheet. As with the charts and graphs, this data has been cleaned and filtered, and is refreshed weekly on Wednesdays.

Figure 9. Sample Chart from California Solar Statistics.ca.gov, County Statistics, October 14, 2009.



6. 2009 California Solar and Distributed Generation Legislation

Below is a summary of key solar and distributed generation legislation that was passed by the CA Legislature this year and signed into law by Governor Schwarzenegger. In most cases, legislation signed by the Governor in 2009 will take effect on January 1, 2010.[8]

Table 8. Summary of 2009 Solar and Distributed Generation Legislation

2009 California Solar Legislation		
Bill (Author)	***Topic***	***Summary***
Assembly Bills		
AB 920 (Wiggins)	Net Surplus Compensation Program under Net Energy Metering (NEM)	AB 920 allows NEM customers to sell any net excess electricity generated over the course of twelve months to their electric utility at a rate to be determined by the CPUC.
AB 1031 (Blumenfeld)	Local Government Renewable Self Generation - program expansion	This bill includes college campuses in the definition of "local government" for the Local Government Renewable Self Generation program originally authorized by AB 2466 (Laird, 2008). That program allows local governments to generate renewable energy at one facility and receive credits for excess generation at other facilities.
AB 1551 (Fuentes)	Eligibility for CSI SASH and MASH	This bill revises and expands the definition of "low-income residential housing" for the purposes of the California Solar Initiative's MASH and SASH programs.
Senate Bills		
SB 32 (Negrete-McLeod)	Small Renewables Feed-in-Tariff - program expansion	Increases the eligible system size for the Small Renewables Feed-in-Tariff program originally established by AB 1969 (Yee, 2006) from 1.5 MW to 3MW. This bill also requires the CPUC to adjust the price of this tariff based on environmental attributes, and also increases the statewide program cap from 500 MW to 750 MW.
SB 412 (Kehoe)	Self-Generation Incentive Program (SGIP) – program expansion	Provides the CPUC authority to include new eligible distributed energy resources in SGIP based on greenhouse gas (GHG) emissions reductions. The bill also extends SGIP through January 1, 2016.

7. Contact Information

For ***PRESS INQUIRIES*** about the CPUC portion of the California Solar Initiative, contact:

Terrie Prosper, News and Public Information Office
California Public Utilities Commission
505 Van Ness Ave.
San Francisco, CA 94102-3298
Email: **news@cpuc.ca.gov or 415-703-1366**

For ***POLICY OR PROGRAM DEVELOPMENT QUESTIONS***, contact:

California Solar Initiative and Distributed Generation Information Line
Email: **energy@cpuc.ca.gov or 415-355-5586**

Go Solar California! – CSI consumer *Web site*	www.GoSolarCalifornia.ca.gov
The CSI Program Administrators use an online tool to calculate the up-front Expected Performance Based Buy down (EPBB) incentive, known as the EPBB Calculator	www.csi-epbb.com
The CSI Program Administrators use an online application tool and reporting database, known as PowerClerk™	csi.powerclerk.com
Up-to-date information about the program's current incentive level, or "step" can be found on the online CSI Trigger Tracker	www.csi-trigger.com
California Solar Statistics, a data reporting *Web site* that draws directly from the CSI database and is updated weekly	www.CaliforniaSolarStatistics.ca.gov
Information about the CPUC regulatory proceeding that deals with the CSI Program	www.cpuc.ca.gov/PUC/energy/solar
Pacific Gas and Electric Company	www.pge.com/solar
Southern California Edison	www.sce.com/CSI
California Center for Sustainable Energy (CCSE) – offering Solar Rebates in San Diego Gas and Electric Territory and the Solar Hot Water Pilot Program	www.energycenter.org
GRID Alternatives, Program Manager for the Single Family Affordable Solar housing (SASH)	www.gridalternatives.org
CSI RD&D Program Manager (Itron)	www.CalSolarResearch.ca.gov

Footnotes

[1] Southern California Gas Company (SoCalGas) is not included in the CSI because the program is funded through electric ratepayers.

[2] The Million Solar Roofs goal was not adopted by the Legislature in its authorization of the State's solar programs as an explicit target for the number of projects. Instead, the Legislature adopted a 3,000 MW capacity goal. However, if the entire capacity goal were installed (hypothetically) in only small residential systems averaging 3 kW in size, it would cover approximately one million roofs. In practice, the CPUC expects approximately one-third of the capacity installed through the CSI program to be in the residential sector and two-thirds in the non-residential sector. Since non-residential systems are fewer in number, but larger in terms of per-project capacity, the number of systems installed will not reach one million at the time when the CSI program capacity targets are achieved.

[3] The California utilities contract for a variety of renewable resources, including large and small solar power plants as part of the RPS Program. Updates on the progress of the RPS program can be found at http://www.cpuc.ca.gov/PUC/energy/Renewables/.

[4] The Go Solar California web portal can be accessed at: www.GoSolarCalifornia.ca.gov.

[5] *Go Solar, California!* Program Components do not include the small multijurisdictional investor-owned utilities (e.g., Sierra Pacific Power, Pacific Power, Mountain Utilities, and Bear Valley Electric Service.)

[6] Energy and Environmental Economics, Inc.

[7] Completed systems include all projects that have reached "Pending Payment", "Completed", and "PBI In-Payment" in the PowerClerk™ database.

[8] AB 1551 contained an urgency clause and took effect as soon as it was signed by the Governor on October 11, 2009.